

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: Laboratories & Cooperative Institutes**

**GOAL STATEMENT:**

NOAA's Ocean, Coastal, and Great Lakes Research programs seek to improve the protection, restoration, and management of coastal and ocean resources through research and monitoring activities that support ecosystem-based management. These programs will accomplish this goal by providing:

- Ecosystem research to analyze ecosystem management decisions and their outcomes;
- Integrated observing and data management systems;
- Outreach and education to improve public understanding and use of coastal and marine ecosystems;
- Partnerships for place-based ecosystem approaches to management; and
- International diplomacy, negotiation, and partnerships.

**BASE DESCRIPTION:**

To be an effective steward of the ocean, coastal, and Great Lakes environments, NOAA relies on state-of-the-art research conducted at in-house laboratories and by external partners. The three OAR laboratories supporting the agency under this subactivity provide long-term research and scientific expertise necessary to meet NOAA's stewardship mission. Three partnership programs also support this activity primarily through peer-reviewed proposals to the external research community. These labs and programs are the Atlantic Oceanographic and Meteorological Laboratory (Florida), Great Lakes Environmental Research Laboratory (Michigan), Pacific Marine Environmental Laboratory (Washington), the National Sea Grant College Program, the Ocean Exploration Program, and the National Undersea Research Program. Ocean, Coastal, and Great Lakes Research laboratories and programs are regularly evaluated by outside experts for quality and relevance to NOAA's management mission. High quality, peer-reviewed research is the basis of sound decision-making.

Previously, the LIDAR research activity at the Environmental Technology Laboratory (ETL) was also carried under this line item. However, scientists, program managers and the affected strategic goal and program leads have determined that this work is more closely aligned with the Coastal Estuaries and Oceans (CEO) program in the Weather and Water Goal. Accordingly, the resources for this research activity are being transferred in base to the Laboratories and Cooperative Institutes line item in the Weather and Air Quality Research budget subactivity. This will co-locate ETL's LIDAR research with its other CEO activities.

The primary objective for Ocean, Coastal, and Great Lakes Research is to protect and restore ocean, coastal, and Great Lakes resources. In support of this objective, we have identified the following priority research areas:

- Ecosystem Observations—monitor coastal and ocean ecosystems.
- Ecosystem Research—activities in support of ecosystem modeling and forecasting, technology transfer, undersea research and exploration.
- Aquaculture—research and outreach efforts focusing on near shore and offshore systems development, genetics, physiology, endocrinology.
- Corals—health and monitoring activities.
- Coastal and Marine Resources—activities that support improved resource management decision-making.
- Habitat—invasive species research and outreach.

**Benefits of our approach:**

- NOAA is a science-based agency whose scientists have the expertise to conduct the highest quality research, subject to peer-review by outside experts.
- In-house experts provide objective answers and direction to managers and the public.
- Long-term (5-10 year), sustained research investment by NOAA labs and their academic partners leads to agency-specific technology and forecasting models that can not be achieved by either entity separately.

Base activities support NOAA's mission goal to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management." In addition, they support the objective, "Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs" under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship."

**PROPOSED LEGISLATION:**

**None.**

### SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Laboratories & Cooperative Institutes					
Laboratories & Cooperative Institutes (ECO)	19,764	22,264	19,891	19,770	(121)
Laboratories & Cooperative Institutes (WW)	476	492	-	-	-
Payment to OMAO	98	-	-	-	-
TOTAL	20,338	22,756	19,891	19,770	(121)
FTE	107	123	119	119	-

Note: The dollars in this table represent budget authority.

#### PROGRAM CHANGES FOR FY 2007:

**Laboratories and Cooperatives Institutes (+0 FTE and -\$121,000):** NOAA requests a decrease of 0 FTE and -\$121,000 as a result of realigning the base resources for this line item.

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: Oceans, Coastal, and Great Lakes Research Laboratories & Cooperative Institutes (\$2,957,000).

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: National Sea Grant College Program**

**GOAL STATEMENT:**

NOAA's National Sea Grant College Program seeks to:

- Conduct research to enable NOAA to tackle priority problems and opportunities identified by coastal residents and businesses and local, regional, state and Federal agencies;
- Transfer scientific research results to user groups such as natural resource managers and coastal business people;
- Provide training opportunities for K-12 teachers to bring the sciences into the classroom as well as for undergraduate and graduate students to be mentored by senior researchers; and
- Inform the public about marine and coastal issues through extension and communications projects.

**BASE DESCRIPTION:**

**Sea Grant Network** – NOAA's National Sea Grant College Program enhances the development, use, and conservation of the Nation's marine and Great Lakes resources through a network of Sea Grant Colleges that conduct education, training, and research in all fields of marine and Great Lakes study. The 30 state Sea Grant programs, located in every coastal and Great Lakes state and Puerto Rico, serve as the core of a dynamic national network of more than 300 participating institutions involving more than 3,000 scientists, engineers, outreach experts, educators and students. The Sea Grant network addresses key issues and opportunities in areas such as aquaculture, aquatic invasive species, coastal community development, estuarine research, fisheries management, coastal hazards, marine biotechnology, marine engineering, seafood safety and water quality. As a non-regulatory program, Sea Grant focuses on generating and disseminating science-based information to a wide range of groups. Some of these include: commercial and recreational fishermen, educators, fish farmers, state and local planning officials, port and harbor commissioners, seafood processors and retailers, and natural resource, water and environmental quality managers.

Sea Grant is developing a system of regional networks that allows for organizing multi-state responses to regional/ecosystem-level problems. This effort supports the U.S. Ocean Action Plan and a major Ocean Commission recommendation that NOAA move to a regional ecosystem management approach and develop research and information plans that identify priority actions to coordinate ocean and coastal activities in each region. Sea Grant will play a key role in NOAA's efforts by applying its resources to engage regional and local stakeholders through the 30 state Sea Grant programs. Sea Grant expects these regional plans to be completed by FY 2009. Once the plans are completed, Sea Grant will target research, education, extension, and outreach resources to support the priority actions identified in the plans. This new regional focus will enhance Sea Grant's ability to make a critical contribution to this NOAA effort.

**Research** – Sea Grant funds high-quality research that is responsive to user needs, bringing university expertise to bear to solve today's marine environmental problems. Each of the Sea Grant colleges conducts research to solve problems and explore new uses for the world's marine, Great Lakes and coastal resources. This work addresses priority problems and opportunities identified by coastal resource managers and users. As a national network of research institutions, Sea Grant leads the Nation's efforts in the emerging field of marine biotechnology, addressing critical medical, food and environmental concerns.

**Education** – For three decades, Sea Grant has provided national leadership in enhancing marine literacy for grades K-12 and in developing professionals who understand marine and aquatic science and research. Sea Grant programs offer programs such as summer in-service programs, newsletters, speakers and curriculum materials. By developing innovative science curricula and teacher training programs, and embracing new technologies to enhance learning and pique students' curiosity, Sea Grant helps students understand how relevant science is to their lives. At the university level, Sea Grant recruits and trains undergraduate and graduate students, and employs senior researchers who form a national brain trust for dealing with coastal economic and environmental challenges.

**Outreach and Extension** – One of Sea Grant's greatest strengths is its ability to help clients use knowledge and research results through a broad multidisciplinary approach to outreach. The results of Sea Grant research are communicated to users at all levels in myriad ways. Outreach education activities for the public and private sectors are conducted through NOAA and: 1) a *communications program* comprised of writers, editors and media specialists who create a variety of printed and electronic information products for many audiences, including the general public; and 2) an *extension program* consisting of an interactive network of about 300 specialists and field agents (mostly university-based), who transfer information and research results to the marine and aquatic community. The overall goal of extension education is to effect change by having individuals, groups or institutions use science-based information.

**Technology Transfer** – Sea Grant advisory specialists and coastal field agents convey the needs of the marine communities to university scientists, and transfer research results to resource users and managers at the local level. Sea Grant communications specialists package and deliver research, outreach and educational information on a wide range of topics, from fishing vessel safety to coastal erosion, using the full spectrum of modern print, electronic and mass media. Sea Grant organizes and hosts hundreds of scientific and public conferences and workshops each year on topics including: zebra mussels and other invasive species, commercial fishing, seafood processing, aquaculture, autonomous underwater vehicles, and offshore structures.

**Program Evaluation** – Sea Grant has implemented a rigorous four-year external performance review process for its federally sponsored university-based state programs. Performance review teams are comprised of highly experienced, distinguished, knowledgeable individuals. Performance is judged quantitatively, performance benchmarks, and metrics which were developed with the help of outside experts. Foremost among these benchmarks is a program's impact on mission and programmatic objectives as well as its connection with users of science-based information. Individual program performance is used to determine merit-based funding for each state program.

**Benefits:**

- Stable partnerships between NOAA and the Sea Grant institutions allow the Agency to address long-term programmatic goals and develop constituent relationships and local leadership nationwide.
- Having local management in place ensures NOAA's investment flows to the highest local priorities, bringing the most appropriate university resources to bear on these problems.
- Sea Grant's extension and outreach infrastructure enables rapid transfer of objective information to users, timely identification of emerging issues and a forum to engage local constituencies in policy and priority setting.
- Sea Grant can and does reach, literally, millions of people through its communication, education and extension networks. In a world where public awareness and knowledge of the environment will be increasingly critical to public policy, Sea Grant capabilities play an important role for the Agency in transferring objective information to a diverse, nationwide audience.
- Sea Grant plays a unique and important role in advancing our national interest in marine resources. Together with the Office of Naval Research and the National Science Foundation, Sea Grant and other NOAA programs provide the only sustained Federal contact and funding source for universities with marine research capabilities. Sea Grant provides a regional and national research focus while supporting marine and coastal resource research of immediate public importance and application. It is virtually the only source of funding in the United States for marine policy studies.
- By employing the expertise and skills of the network's universities, research institutions and programs, Sea Grant activities have spurred economic growth and cost savings, created new products and services, enhanced coastal and marine resource management, reduced the loss of life and property, and educated tens of thousands of K-12 and university students.

Base activities support NOAA's mission goal to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management." In addition, they support the objective, "Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs" under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship."

**PROPOSED LEGISLATION:**

**None.**

### SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: National Sea Grant College Program					
National Sea Grant College Program Base (Base)	57,169	49,310	49,544	50,285	741
Aquatic Nuisance Species/Zebra Mussel Research	986	986	990	990	-
Gulf of Mexico Oyster Initiative	986	986	990	990	-
Marine Invasive Species Program	247	-	-	-	-
Oyster Disease Research	986	986	990	990	-
National Sea Grant Law Center	-	1,480	598	598	-
Fisheries Extension/Outreach Program (Sea Grant)	1,478	986	990	990	-
<b>TOTAL</b>	<b>61,852</b>	<b>54,734</b>	<b>54,102</b>	<b>54,843</b>	<b>741</b>
<b>FTE</b>	<b>17</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>-</b>

Note: The dollars in this table represent budget authority.

### PROGRAM CHANGES FOR FY 2007:

**National Sea Grant College Program (+0 FTE and \$741,000):** NOAA requests an increase of 0 FTE and \$741,000 to continue its current research operations and activities.

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: National Sea Grant Law Center (\$896,000).

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: National Undersea Research Program**

**GOAL STATEMENT:**

NOAA's National Undersea Research Program (NURP) seeks to:

- Promote healthy coasts and effective management;
- Foster stewardship of the ocean's resources;
- Promote discovery via hypothesis driven research;
- Develop appropriate technologies for undersea research; and
- Develop innovative education & outreach efforts through partners.

**BASE DESCRIPTION:**

NURP's mission is to increase knowledge essential for wise use of oceanic, coastal, and large lake resources through advanced undersea research. NURP is a comprehensive underwater research program that places scientists underwater, either directly through the use of submersibles, underwater laboratories, and wet diving, or indirectly by using remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), and observatories. The in situ approach allows acquisition of otherwise unobtainable observations, samples, and experimentation related to the Nation's, NOAA's, and regional priority research needs. NURP pioneers new techniques and technologies and identifies emerging issues for operational programs.

NURP is primarily a grants and infrastructure program with most of its funding going to the extramural research community, primarily academia. NURP supported research is peer-reviewed by outside experts and the highest priority is given to proposals for studies in the United States, its large lakes, territorial seas, and adjacent waters. Through ownership or leasing, NURP provides undersea systems that work from the coast to the deep sea.

NURP's long-term strategy is to provide state-of-the-art undersea research technology to meet NOAA's research needs through two centers on the West coast, and a restructured center support system that focuses on the east coast and Gulf of Mexico. In FY2006, NURP operated two regional centers which focused on Hawaii and the Pacific, and Alaska and Polar Regions, while maintaining a minimum level of support to the East coast center that maintains the capability of Aquarius, the world's only underwater science laboratory. NURP plans to conduct a competition in FY 2007 to restore capability on the East coast and Gulf of Mexico, restore full research capability at the West Coast and Polar Regions Center, and enable NURP to resume contributions to the National Deep Submergence Facility.

**Benefits:**

- NURP owns and operates the Aquarius, the world's only underwater science laboratory. It is located off Key Largo, Florida, in the Florida Keys National Marine Sanctuary. Aquanauts live on and study sensitive coral reef ecosystems threatened by natural and human-caused impacts and are able to perform studies not possible through traditional diving techniques.
- NURP operates undersea ROVs and AUVs that are independent of the surface, battery powered, and controlled by computers that are deployed from ships of opportunity.
- NURP scientists explore the deep ocean-depths of up to 4,500 meters (15,000 feet) through research submarines including the Johnson Sea-Link, Delta, Alvin, and Pisces V. NURP serves as the lead office for fulfilling NOAA's statutory responsibility to improve the safety and performance of civilian divers.

**Research:**

- **Promote healthy coasts and effective management** - Driven by concern for the health and conservation of marine ecosystems and resources, certain marine and coastal areas are of particular concern (e.g., coral reefs, marine protected areas, marine sanctuaries) and in need of undersea research. NURP supports research to understand the effects of anthropogenic stressors on marine organisms, assesses the physical and biological impacts of natural and anthropogenic-related disasters (e.g., hurricanes, tsunamis, flood plumes, and pollutant spills), and develops methods to evaluate the economic costs of destruction and recovery.
- **Foster stewardship of the ocean's resources** - NURP supports NOAA's National Marine Fisheries Service's responsibilities to improve Federal and state abilities to effectively manage and restore fisheries by developing and employing advanced technology to research stock assessments of mammals, fish and invertebrates; mapping Essential Fish Habitat; and assessing damage from mobile fishing gear.
- **Develop appropriate technologies for undersea research** - The changing and difficult study of the ocean realm requires new intellectual approaches and a national investment in a new mode of conducting undersea investigations. New approaches, such as seafloor observatories, greatly enhance traditional capabilities by providing invaluable long-term monitoring and continuity of observations. NURP is engaged in developing new technologies as well as ensuring a sustained undersea observing system.

Base activities support NOAA's mission goal to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management." In addition, they support the objective, "Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs" under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship."

**PROPOSED LEGISLATION:**

None.

### SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: National Undersea Research Program (NURP)					
National Undersea Research Program (NURP)	12,321	4,192	4,162	9,152	4,990
National Institute for Undersea Science and Technology	4,928	4,931	-	-	-
<b>TOTAL</b>	<b>17,249</b>	<b>9,123</b>	<b>4,162</b>	<b>9,152</b>	<b>4,990</b>
FTE	5	6	6	6	-

Note: The dollars in this table represent budget authority.

### PROGRAM CHANGES FOR FY 2007:

**NOAA's Undersea Research Program (NURP) (+0 FTE and \$4,990,000):** NOAA requests an increase of 0 FTE and \$4,990,000 to restore NURP's capability to provide state-of-the-art undersea research capabilities, both technical and technological, to meet NOAA's research needs covering the East coast, Gulf of Mexico, and the Caribbean. In FY2006, NURP supported one East coast center and operated two centers that focused on Hawaii, the Pacific, Alaska and the Polar Regions. NURP will build on the remaining East coast center, existing arrangements at the National Institute for Undersea Science and Technology (NIUST). NURP created a new overall research strategy to restructure the program on the East coast and Gulf of Mexico. This funding initiative allows NURP to fully comply with Congressional mandates and recommendations, serve scientists and the general public by providing cutting edge research and technologies, and provide managers and stakeholders with tools, technologies and data to serve as stewards of our nation's natural resources.

### Statement of Need

As a leader in undersea research, techniques and technology for the past 23 years, NURP has continuously and successfully accomplished hypothesis-driven research using novel and emerging technologies to provide NOAA managers with the necessary information to make well-informed decisions. NURP provides these services through a national network comprised of regionally-based centers, a university-based institute and a headquarters staff. Since 1983, NURP has strived to provide undersea research and technologies aimed at leveraging regional expertise with the use of advanced underwater technologies to meet NOAA's national needs. In the past for a given year, NURP has supported approximately 100 undersea research projects, 80 human-occupied submersible dives, 300 ROV dives, and 13,000 SCUBA and technical dives with over 300 partners institutes and 900 participants.

NURP's research findings have had significant implications at many levels and have been used in Congressional arguments to support management regulations and decisions. NURP complies with several Congressional mandates and is a key program in the fulfillment of many of the DOC and NOAA mission needs, such as the U.S. Ocean Action Plan's to "Research, Survey, and Protect Deep-Sea Coral Communities"; 33 U.S.C. §883d, which authorizes NOAA to "Increase engineering and scientific knowledge by conducting developmental work for the improvement of... instruments, and equipments"; the National Materials and Minerals Policy Research and Development Act (PL 96-479) and Deep Seabed Hard Minerals Resources (26 U.S.C. 1419) to "Research and Understand the formation, distribution, and physical and chemical characteristics of hydrothermal sulfides" and to conduct environmental assessments of "Long and short term effects of commercial recovery on the deep seabed biota; and assessments of the effects of sea based processing activities". Furthermore, this initiative allows NURP to fulfill DOC's science and technology leadership and stewardship Strategic Goals, as well as filling many of the technical and technological gaps stated in NOAA's "20-Year Research Vision" plan. All of this is done by tapping on the strength and leverage from the regional centers associated with NURP. To be effective in its mission, NURP requires a restructuring of its program to adequately address the needs of the Gulf of Mexico, East coast and Caribbean in order to provide the most of effective support to the entire nation.

### **Proposed Actions**

NURP's mission, as NOAA's only program dedicated to underwater science, relies on its capability to conduct undersea research in situ. As such, a regional network of University-based centers must be maintained to adequately serve in all ocean areas where NOAA has management responsibilities. This network of centers will provide a regional-to-national research infrastructure, while also providing a cadre of technical and technological experts with knowledge of local and regional research needs. Restructuring NURP's current East coast program to more adequately cover the Gulf of Mexico, Caribbean and East coast, will be accomplished through an open process, which will define needs and develop the plan for restructuring in consultation with NOAA, other Government agencies, academic and research institutes, and the private sector.

Efforts include:

- Restructuring the East coast program to establish two centers which will provide technological support to meet NOAA's research needs for the East coast, Gulf of Mexico, and the Caribbean. NURP currently provides research support to the West coast through its two Pacific centers; this new effort will provide geographical balance and research coverage by setting up a competitive process to assure two NURP Centers in the East coast.
- Restoring funding to the West coast and Polar Regions center to meet research requirements. This effort will augment the West Coast and Polar Regions Research Center so that it can continue to fulfill its regional program and contributions to NURP and NOAA's mission.

## Benefits

The planned research adjustments will contribute to NOAA achieving its strategic goals by capitalizing on current and previous NURP achievements and regional expertise. Restructuring the East coast program will ensure the benefits of comprehensive regional coverage and undersea technical and technological expertise are made available to decision-makers in a cost-efficient manner that is useful to their management processes. Coupled with a funding increase over FY 06 levels to the West Coast and Polar Regions center, NURP will be positioned to better answer NOAA's national needs. Most importantly, this set of initiatives will provide NURP users, which comprise undersea researchers, managers and stakeholders, outreach entities, decision-makers and the general public, with a comprehensively structured network of undersea research centers providing access to cutting edge technologies and technical expertise, regional data and information pertinent to research and management, and an opportunity for the development of new tools and technologies to bridge the gaps in our knowledge of the deep seas.

## Performance Goals and Measurement Data

This increase will support the Department of Commerce Strategic Goals to "Foster science and technological leadership by protecting intellectual property, enhancing technical standards, and advancing measurement science" and "Observe, protect, and manage the Earth's resources to promote environmental stewardship", respectively. Specifically, this increase supports NOAA's Ecosystem Performance Goal of "Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management" and the GPRA performance measure, "Cumulative number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management."

<b>Performance Goal: Ecosystem</b> <b>Performance Measure:</b> Annual number of coastal, marine, and Great Lakes ecological characterizations that meet management needs.	<b>FY 2005</b>	<b>FY 2006</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2011</b>
Without Increase	57	16	16	16	16
With Increase	57	16	32	32	32

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: National Institute for Undersea Science and Technology (\$4,931,000).

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: Ocean Exploration**

**GOAL STATEMENT:**

This activity is NOAA's multi-line office (OAR/NOS/NMFS) investment in undersea exploration, science, and technology in both the Deep Ocean and areas of special concern, such as the U.S. Exclusive Economic Zone (EEZ) and National Marine Sanctuaries (NMS). The program integrates existing NOAA programs and external academic, federal, and commercial participants to increase our knowledge of the ocean realm to support NOAA's goal of Ecosystem Management.

**BASE DESCRIPTION:**

This program seeks to increase our national understanding of ocean systems and processes through partnerships in several major voyages of discovery per year, as well as by funding 20-40 additional missions and exploration-related projects per year. It uses ten percent of all funds for education and outreach to improve ocean literacy in America and to inform America's school children and stimulate their interest in ocean science. Information from these cruises are made available on our award-winning website [www.oceanexplorer.noaa.gov](http://www.oceanexplorer.noaa.gov). FGDC compliant metadata and data from these expeditions are appropriately archived, and the program works with the scientists to develop products and materials including maps, videotapes, presentations, and summary reports to distribute to target audiences. The program spends approximately seventy percent of its funds outside of the agency on science that benefits NOAA's understanding of the oceans and ecosystems. In late FY 2007, a new Exploration vessel, *Okeanos Explorer*, is scheduled for sea trials. Currently it is anticipated that a portion of the Ocean Exploration base funding will be transferred to the Office of Marine and Aviation Operations to fund the operation and maintenance of this ship. Ocean Exploration will also continue to support expeditions that are selected through a peer-reviewed process. Exploration focuses on four key goals as defined by multiple national advisory panels:

**Explore unknown and poorly known areas of the ocean:** Exploration science returns to areas that may have been visited with outdated technology to refine our understanding of what resources and processes are in the oceans. The oceans potentially hold a vast untapped economic potential. The wealth of living and non-living resources yet to be discovered may provide new opportunities for medical science. For example, microbial organisms that thrive in deep-sea vents have been determined to have significant biomedical potential in pharmaceutical applications.

**Ocean Mapping:** Less than ten percent of the US EEZ has been mapped with current technology, and many resources, habitats, and features remain undiscovered. Our ability to manage by ecosystems is necessarily dependent upon defining those ecosystems completely. In conjunction with other NOAA mapping efforts, ocean exploration routinely maps ocean habitat during expeditions to discover and record the physical, biological, geological, archaeological, and chemical nature of the oceans.

**New Technology:** Advancing knowledge requires new technology including data collection. The Ocean Exploration Program invests in new technologies for ocean discovery. The program coordinates new technology needs and investments with other NOAA programs and other federal agencies through the National Ocean Partnership Program (NOPP). For FY06, the program's technology focus is on the use of autonomous platforms and vehicles to meet NOAA's data needs, the role for industry in exploring the ocean, and new and emerging sensor technologies.

**Education and Outreach:** The program allocates at least ten percent of funding to expanding public awareness and knowledge of oceans in order to increase ocean literacy and stewardship. The program website is rated in the top five worldwide, by a major international science education authority. This website is visited by over 5,000 people per day and contains thousands of pages of detailed information about our recent discoveries. It includes teaching materials for educators, daily logs of expeditions, immediate results of the discoveries as they happen, and new real-time satellite technology to bring students and scientific experts to the undersea from any remote computer.

**Benefits:** NOAA's Ocean Exploration program is a national program, providing the opportunity of discovery to scientists in academia, federal agencies, and commercial sector. No other dedicated source of funding or logistics is found for discovery-based ocean science. While the economic and social benefits of anticipated discovery are potentially significant, the promise of discovery is clear; wherever the program has looked, new discoveries and information are found.

NOAA programs benefit from new sources and scales of information generated from this program:

- Greater knowledge of living marine resources, their habitats, and ecosystems enhances fisheries and ocean stewardship;
- Comprehensive site surveys and inventories inform NOAA's National Marine Sanctuaries management;
- Characterization of the EEZ improves habitat and marine resource management;
- Inventories our Nation's and other submerged cultural and historic resources are significantly increased; and
- Governance and scientific investigation in support of the international Census of Marine Life.

Base activities support NOAA's mission goal to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management." In addition, they support the objective, "Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs" under the Department of Commerce Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship."

## PROPOSED LEGISLATION:

In FY2005 the 109th Congress introduced two Bills: H.R. 3835 and S. 39 to support the National Ocean Exploration program within NOAA.

### SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Ocean Exploration					
NMNH East Wing (Ocean)	4,928	-	-	-	-
Ocean Exploration	22,670	13,659	13,615	15,128	1,513
Submersible Microtechnology Research	969	-	-	-	-
Exploration Autonomous Underwater Vehicle	-	494	-	-	-
TOTAL	28,567	14,153	13,615	15,128	1,513
FTE	14	11	11	11	-

Note: The dollars in this table represent budget authority.

## PROGRAM CHANGES FOR FY 2007:

**Ocean Exploration (+0 FTE and \$1,513,000):** NOAA requests an increase of 0 FTE and \$1,513,000 to restore key investments in the nation's only program dedicated to systematically exploring the world's oceans. NOAA brings the best of the nation's scientists to the leading edges of ocean discovery using interdisciplinary expeditions to unknown or poorly known regions and through innovative experiments. Through these investments, NOAA will continue to develop the capabilities necessary to lead America's ocean discovery efforts.

## Statement of Need

In 2000, the President's Panel on Ocean Exploration called for a robust national ocean exploration program propelled by the spirit of discovery. The panel's recommendations led to the establishment of the Office of Ocean Exploration (OE) within NOAA. A 2003 National Research Council (NRC) report reiterated the need for a comprehensive national ocean exploration program and offered specific recommendations on technology and infrastructure requirements. In response to the U.S. Commission on Ocean Policy's recommendations for a National Ocean Exploration Program, the U.S. Ocean Action Plan highlighted the development of a new NOAA vessel dedicated to ocean exploration.

The Navy transferred the USNS *Capable* to NOAA in September 2004 for use as the Nation's first vessel solely dedicated to ocean exploration. Conversion of the ship, now called the *Okeanos Explorer*, is progressing as scheduled. OE funding has also been critical for the operations of the UNOLS fleet and the National Deep Submergence Facility (NDSF) assets (e.g., ALVIN submersible, JASON ROV) since 2002.

### **Proposed Actions**

To support NOAA's ability to fulfill its science, environmental assessment, and technology development responsibilities, investments will be made in support and staffing for the *Okeanos Explorer* as well as ocean exploration projects using the UNOLS fleet and NDSF facilities.

Efforts include:

- UNOLS and NDSF Facilities (\$1,000,000) – Funds will continue OE investment in UNOLS fleet and NDSF assets. Based on budget projections for FY2007, \$1,000,000 will lease approximately 20 days of ship and submersible time using a Class I UNOLS ship and either the ALVIN submersible or JASON ROV. The specific ship/submersible combination will be determined based on the scientific requirements of the project.
- Extramural Scientific Support (\$513,000) – Direct funds for scientists participating in two ocean exploration missions. One major expedition focusing on deep-water habitat characterization will use the UNOLS/NDSF asset combination. The second project will leverage funding for an existing research cruise by providing add-on funds dedicated for an exploratory component. Final project selections will be made through a peer-review proposal process and funds will be allocated via grants.

### **Benefits**

While the economic and social benefits of anticipated discovery are potentially significant, the promise of discovery is clear; wherever the program has looked, new discoveries and information are found. The specific investments listed above will immediately benefit a broad swath of the marine science community including researchers and marine operators at universities, NOAA, other government agencies and the private sector. The information acquired from these investments will help provide the critical foundation for adequate management of our ocean resources.

### **Performance Goals and Measurement Data**

This increase will support the objective, "Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs" under the Department of Commerce strategic goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship." Specifically, this increase supports the Ecosystem Performance Goal, "Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management," and the GPRA performance measure, "Cumulative number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management."

<b>Performance Goal: Ecosystem</b>					
<b>Performance Measure:</b>	<b>FY 2005</b>	<b>FY 2006</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2011</b>
Annual number of coastal, marine, and Great Lakes ecological characterizations that meet management needs.					
Without Increase	46	22	18	16	16
With Increase	46	22	24	22	22

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: Exploration Autonomous Underwater Vehicle (\$494,000).

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: Other Ecosystems Programs**

**GOAL STATEMENT:**

In addition to supporting its individual Ocean, Coastal, and Great Lakes Research laboratories, NOAA Research also seeks to initiate and maintain research and development programs that cut across its own intramural foundation as well as other NOAA's ocean, coastal, and Great Lakes research and service programs and the university community in an effort to advance the cutting edge of NOAA research capabilities.

**BASE DESCRIPTION:**

**NOAA Aquatic Invasive Species (AIS) Program:** Aquatic invasive species disrupt the stability of coastal ecosystems, thereby affecting recreational, economic, and other beneficial uses of coastal resources. They constitute one of the largest present and future threats to coastal ecosystems, coastal economies, protected habitats and species, and human health in coastal regions. Invasive species are one of the two greatest threats to endangered species (second only to habitat loss), and they have been responsible for some of the most dramatic fishery losses in recent times (e.g., Lake trout, turbot, whitefish, and salmon in the Great Lakes). Hundreds of millions of dollars are spent each year to mitigate the effects of non-indigenous aquatic species in our coastal and Great Lakes ecosystems and to prevent new invasions. The AIS program implements a national program to detect, monitor, and control aquatic invasive species. Currently, this program focuses on the prevention and control of invasive species. In the outyears, this item will include research for the development of new control technologies. Activities under the AIS program include, but are not limited to, ballast water research, education and outreach, and control activities, which include eradication, population reduction, preventing further spread, and/or mitigating the impact of invasive species on user groups.

Efforts undertaken by the NOAA AIS Program involve cooperation and coordination between NOAA Research (including the National Sea Grant College Program), National Ocean Service, and National Marine Fisheries Service, eight other Federal agencies, and the academic community. This program is a critical component of the Department of Commerce's support of the interagency Aquatic Nuisance Species Task Force and National Invasive Species Council. NOAA co-chairs each of these two policy bodies. The AIS program responds to the mandates identified in the National Aquatic Nuisance Prevention and Control Act, the National Sea Grant College Program Act, and Executive Order 13112. All of these mandates identify the need for early detection, monitoring, and reducing the impact of aquatic invasive species.

**Benefits**

- An AIS program that is responsive to legal mandates and the most urgent national needs related to the growing AIS problem;
- Partially meet legislative prevention mandates;
- Increased number of pathways and high-risk species identified, and effective approaches developed to reduce invasion risk to resources for which NOAA is the Nation's steward;

- One or more ballast water treatment technologies and management approaches verified and available for use;
- Other pathways reduced or interdicted through targeted risk-reduction actions, education, and increased public awareness and participation;
- Increased ability to detect new AIS invasions early enough to allow targeted rapid response;
- Availability of management information to help control invasive species, (e.g., life- history parameters, potential range, and potential pathways identification); and
- Development of new control technologies, which will reduce the economic and environmental costs of highly invasive species.

**NOAA Marine Aquaculture Program:** NOAA’s Aquaculture Competitive Grants Program funds external partners to: (1) expand regional efforts in developing new species suitable for aquaculture and (2) promote sustainable aquaculture through support for projects that: (a) field-test new environmentally compatible production systems; (b) develop new technologies, including offshore, near-shore, and re-circulating aquaculture systems; and (c) improve and clarify the regulatory framework and coastal zoning for aquaculture. These projects lead to technical developments in genetics, nutrition, disease, hormone manipulation, biotechnology, and mitigation of environmental impacts. In addition, the Program develops collaborative studies with international partners on ecosystem effects and carrying capacities for coastal ecosystems. NOAA’s aquaculture education and extension network facilitates the transfer of research into business operations as well as informs the public and practitioners about key issues and information related to aquaculture. The program promotes an environmentally friendly and profitable aquaculture industry that will alleviate stress on natural fish stocks, create jobs, provide healthy protein to Americans at a reasonable cost, improve food safety, and help alleviate our Nation’s trade deficit.

**Background:** The United States faces a “seafood deficit” amounting to \$7 billion annually. We import more than 60 percent of the fish and shellfish we consume. Marine aquaculture in U.S. waters has the potential to provide up to 25 percent of our seafood within the next 20 years in addition to providing the seed for rebuilding some fishery stocks. The NOAA Marine Aquaculture Program will be at the forefront of efforts to grow the U.S. marine aquaculture industry through an integrated program of research, education, and technology transfer that is focused on key scientific, engineering, environmental, and socioeconomic issues that currently inhibit this emerging industry.

**Benefits:** The NOAA Marine Aquaculture Program is poised to:

- Offset the current \$7 billion annual U.S. trade deficit in seafood through increased domestic production from marine aquaculture;
- Ensure the sustainability of marine aquaculture; and
- Spur job creation in both the production and processing of fishery products, thereby revitalizing fishing communities devastated by collapsing fisheries industries.

Base activities support NOAA’s mission goal to “Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management.” In addition, they support the objective, “Enhance the conservation and management of coastal and marine resources to meet America's economic, social, and environmental needs” under the Department of Commerce Strategic Goal of “Observe, protect, and manage the Earth's resources to promote environmental stewardship.”

**PROPOSED LEGISLATION:**

**None.**

### SUMMARIZED FINANCIAL DATA

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Other Ecosystems Programs					
Aquatic Invasive Species Program	-	986	971	2,477	1,506
Marine Aquaculture Program	-	4,558	1,606	1,606	-
<b>TOTAL</b>	-	5,544	2,577	4,083	1,506
FTE	-	3	4	4	-

Note: The dollars in this table represent budget authority.

### PROGRAM CHANGES FOR FY 2007:

#### Line Item: Other Ecosystem Programs

**Aquatic Invasive Species (AIS) Program (+0 FTE and +\$1,506,000):** NOAA requests an increase of 0 FTE and \$1,506,000 for its Aquatic Invasive Species Program. This represents a strategic decision by NOAA to enhance its capability to address invasive species, a worldwide threat that has implications for the coastal, ocean and Great Lakes resources for which NOAA is our Nation's steward. This increase will augment these efforts and add a critical third component: prevention of invasive species before they occur. Funding will support research to increase NOAA's capability to identify and assess species and pathways that pose the highest invasion danger to NOAA resources, and will develop tools to prevent invasion by these pathways.

**Statement of Need:** Monitoring, control, and other ongoing program activities are necessary to meet NOAA's legal invasive species mandates and to achieve NOAA's goal of protecting coastal and aquatic habitats and resources. Ongoing program activities are insufficient to meet these mandates and to protect NOAA's steward resources. NOAA, Congress, and the National Invasive Species Council have recognized prevention of invasions before they occur as the most powerful and cost-effective approach to invasive species control. The U.S. Commission on Ocean Policy recommended, *"Recognizing the economic and biological harm caused by invasive species, and acknowledging the difficulty of eradicating a species once it is established, aggressive steps should be taken to prevent such introductions."* (Final Report, Chapter 17: "Preventing The Spread Of Invasive Species," p.257). Effective prevention first requires biological and ecological research to establish what species are likely to be invasive, what habitats and ecosystems are most vulnerable to invasion, and what pathways of invasion are most likely to occur. It also requires ecological modeling to predict the environmental impacts of future invasions, and social and economic research and modeling to predict the magnitude of impacts to society and to NOAA's steward resources.

As species and pathways of highest concern are identified, research and technology development is needed to devise and make available tools to stop these invasions from occurring. These tools are needed by resource managers at the local, state, and national levels, as well as by private sector constituents. Tools may include educational or administrative practices or chemical, biological, or mechanical systems.

The NOAA AIS Program is part of a budget initiative involving eight other Federal agencies and is a cooperative effort between NOAA Research, the National Ocean Service, and the National Marine Fisheries Service plus participation by other line offices as well.

### **Proposed Actions**

- Monitoring and Early Detection. NOAA will continue the implementation of a national program to finalize standardized survey methods and protocols, and complete one additional regional aquatic species baseline assessment. These assessments are needed to be able to rapidly identify and respond to the invasion of new species.
- Control. NOAA will continue to implement priority actions identified in national management plans to control established invasive species such as green crab.
- Prioritization of invasion pathways. NOAA will support biological, ecological and socioeconomic research of identified species invasion pathways to determine which are most likely to threaten NOAA resources and what the likely impacts of these invasions might be. The key pathways of direct concern to NOAA include ballast water, aquaculture, commercial and recreational fishing and boating, and live fish and bait trades. NOAA will conduct the necessary research to prioritize these pathways, and develop tools to prevent invasions by these pathways.
- Prevention of primary invasion pathway. Ballast water is the most significant pathway for introduction of aquatic invasive species into coastal waters. The threat of invasion is serious enough that limitations on commercial shipping have been considered. NOAA has specific statutory responsibilities to lead the development new ballast water technologies. NOAA will oversee Ballast Water Technology Development program grants and activities, and will continue coordination of NOAA ballast water activities with Federal, state and NGO partners.

### **Benefits**

Each new invasion has the potential to cost our economy hundreds of millions of dollars by directly affecting or impeding ecosystem-based economic activities and beneficial use of ecosystem resources and by indirectly degrading valuable ecosystem resources. Economic costs associated with new invasions can be reduced or avoided only if high-risk pathways are identified and assessed, and interdiction approaches and tools are developed and implemented. NOAA will move from a reactive to a proactive mode to reduce the number of new invasions through targeted pathways research and development of improved invasion prediction skills and interdiction tools. The most important pathways must be interdicted, but we cannot afford to focus limited resources on pathways that are low risk. It is essential for the Nation's economic and ecological welfare that we identify and assess the level of risk associated with different pathways on a regional basis in order to focus resources where they are most needed and will do the most good. The proposed programmatic increase will allow NOAA to support research to improve the scientific basis for risk identification, assessment, and mitigation for pathways of invasion.

**Performance Goals and Measurement Data**

This increase will directly support NOAA's goals to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management" and "Support the Nation's Commerce with Information for Safe, Efficient, and Environmentally Sound Transportation" (NOAA 2005-2010 Strategic Plan). Specifically, performance measures will cover identification of pathways of invasion likely to pose the greatest threat to NOAA's successful completion of its mission and development of tools to slow or stop invasions by those pathways.

PERFORMANCE MEASURE for Invasive Species Prevention	2007 without Incr.	2007 with Incr.
Prioritization of invasion pathways based on threat to NOAA steward resources	incomplete	complete
Prevention tools developed for priority pathways	0	1
Number of ecosystems for which baseline aquatic species assessments are completed	0	1
Number of established invasive species populations controlled, mitigated, or eradicated	0	1

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: Marine Aquaculture Program (\$2,959,000).

**Subactivity: Ocean, Coastal, and Great Lakes Research**  
**Line Item: Other Partnership Programs**

**GOAL STATEMENT:**

NOAA's Ocean, Coastal, and Great Lakes Research Other Partnership Programs seek to improve protection, restoration, and management of coastal and ocean resources through research and monitoring activities that support ecosystem-based management. These programs accomplish this goal by providing:

- Outreach and education to improve public understanding and use of coastal and marine ecosystems;
- Ecosystem approaches to management decision making;
- Partnerships for place-based ecosystem approaches to management;
- Ecosystem research to analyze ecosystem management decisions and their outcomes;
- Integrated observing and data management systems; and
- International diplomacy, negotiation and partnerships.

**BASE DESCRIPTION:**

The Other Partnership Programs line item contains various programs initiated by Congress.

**PROPOSED LEGISLATION:**

**None.**

**SUMMARIZED FINANCIAL DATA**

(Dollars in thousands)

Subactivity: Ocean, Coastal, and Great Lakes Research	FY 2005 ACTUALS	FY 2006 CURRENTLY AVAILABLE	FY 2007 BASE PROGRAM	FY 2007 ESTIMATE	INCREASE / DECREASE
Line Item: Other Partnership Programs					
Aquatic Ecosystems - Canaan Valley Institute	4,239	5,917	-	-	-
Institute for Science Technology and Public Policy	887	-	-	-	-
Atmospheric Dispersion Forecasting / Jackson State Univ	986	1,480	-	-	-
Great Lakes Toxicity	488	-	-	-	-
Gulf of Maine Council	739	740	-	-	-
Lake Champlain Research Consortium	345	346	-	-	-
NISA/Ballast Water Demonstrations	3,450	2,959	-	-	-
NISA/Alaska	1,479	1,480	-	-	-
Invasive Milfoil	-	246	-	-	-
HI Micronesia Invasive Species Program	-	493	-	-	-
Cooperative Institute for New England Mariculture and Fisheries	2,957	1,972	-	-	-
NH Center for the Study of Lakes and Ecosystems	492	-	-	-	-
Cooperative Sensor Development Lab for Oceans & Climate	492	-	-	-	-
Aquaculture Education Program - Cedar Point MS	1,774	-	-	-	-
Pacific Tropical Ornamental Fish	492	493	-	-	-
Center for Aquaculture Development	-	986	-	-	-
West Alabama Shrimp Acquaculture Program	-	493	-	-	-
Urban Coastal Institute	-	493	-	-	-
Lake Champlain Emerging Threats	-	493	-	-	-
Center for the Environment	-	789	-	-	-
Bio-screening Technology for Imported Seafood	-	986	-	-	-
<b>TOTAL</b>	<b>18,820</b>	<b>20,366</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>FTE</b>	<b>6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

**PROGRAM CHANGES FOR FY 2007:**

**TERMINATIONS FOR 2007:** The following programs, or portions thereof, are terminated in FY 2007: Invasive Species and Partnership Programs (\$20,366,000); Aquatic Ecosystems-Canaan Valley Institute (\$5,917,000); Atmospheric Dispersion Forecasting (\$1,480,000); Gulf of Maine Council (\$740,000); Lake Champlain Research Consortium (\$346,000); NISA/Ballast Water Demonstrations (\$2,959,000); NISA/Alaska (\$1,480,000); Invasive Milfoil (\$246,000); HI Micronesia Invasive Species Program (\$493,000); Cooperative Institute for New England Mari-culture and Fisheries (\$1,972,000); Pacific Tropical Ornamental Fish (\$493,000); Center for Aquaculture Development (\$986,000); West Alabama Shrimp Acquaculture Program (\$493,000); Urban Coastal Institute (\$493,000); Lake Champlain Emerging Threats (\$493,000); Center for the Environment (\$789,000); Bio-screening Technology for Imported Seafood (\$986,000).